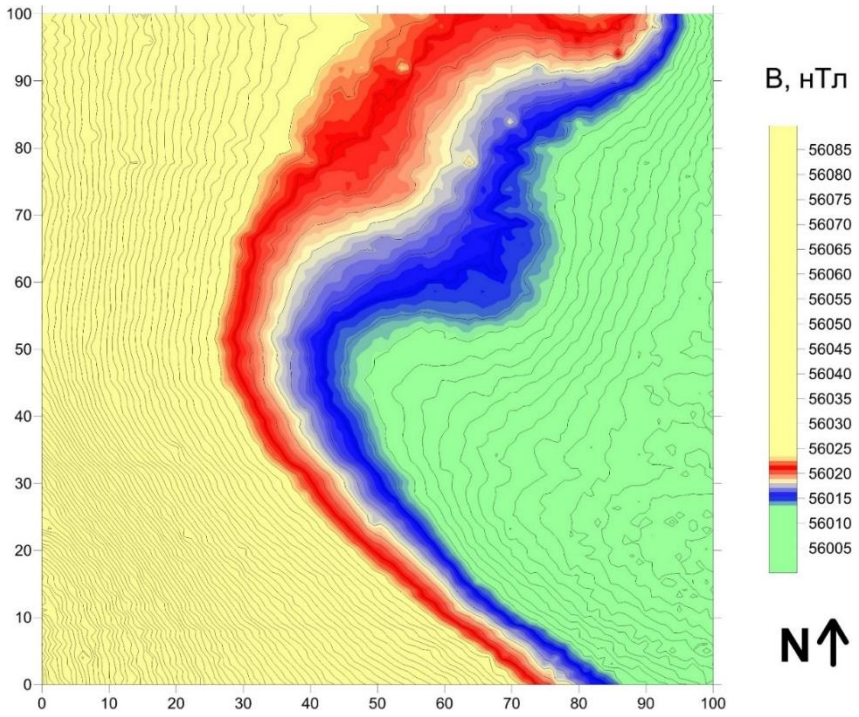

Рис. 1. Магнитная карта места падения метеорита Челябинск LL5.

1. Нархов Е.Д., Сапунов В.А., Денисов А.Ю., Савельев Д.В., Фёдоров А.Л. Магниторазведка места падения метеорита «Челябинск LL5» с помощью протонного квантового Оверхаузеровского магнитометра MMPOS-1gps// Глубинное строение, гидродинамика, тепловое поле Земли, интерпретация геофизических полей. Седьмые научные чтения памяти Ю.П. Булашевича: Материалы конференции.- Екатеринбург.-2013.- С.356-357
2. Krylov P. S., Nourgaliev D. K., Yasonov P. G., Seismic investigations of lake chebarkul in the process of searching chelyabinsk meteorite / ARPN Journal of Engineering and Applied Sciences. VOL. 10, NO. 2, FEBRUARY 2015. 744-746 p.

AMORPHOUS MAGNETISM IN Tb_XCo_{100-X} FILMS

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Magnetron sputtering is one of the most widely used techniques for obtaining film structures. Tb-Co on the other hand, is a promising ferrimagnetic system that can be used, for example, in exchange biased magnetoresistive sensors usually going in a form of thin films. However, magnetron sputtering of Tb-Co leads to the amorphous state due to the particularities of growth mechanisms. Magnetron sputtering also leads to a columnar structure thus making possible a strong perpendicular anisotropy. The amorphous state develops, first of all, due to the difference in sizes of Tb and Co

atoms [1]. The disorder of atoms gives rise to a random magnetic anisotropy. All in all, the investigation of amorphous magnetism and its features in Tb-Co films seems quite reasonable.

In order to study the magnetism of amorphous Tb-Co films a series of specimens was obtained by means of magnetron sputtering. The concentration of Tb x varied from 10 to 45 at.%. Composition control of the specimens was carried out with a help of X-ray fluorescence spectrometry.

The amorphous state of the ferrimagnetic layer has been confirmed by the results of X-ray crystallography of the specimens. Main magnetic properties have been derived from the hysteresis loops measured with a help of a vibrating sample magnetometer at room temperature.

Fig. 1 denotes a distinctive minimum of the saturation magnetization M_S at the compensation concentration x_C=23 at.%. This is an evidence of the ferrimagnetic ordering in Tb-Co films. At concentrations of Tb below x_C the films exhibit a uniaxial anisotropy, while at concentrations greater than x_C the perpendicular anisotropy is present. The following decrease of M_S at concentrations greater than x=37 at.% is a result of the topological disorder, also leading to the randomness of the anisotropy field [2].

The influence of sputtering conditions and following thermomagnetic treatment has been studied as well. Besides that, an additional experiment devoted to determining the influence of mechanical stress has been carried out.

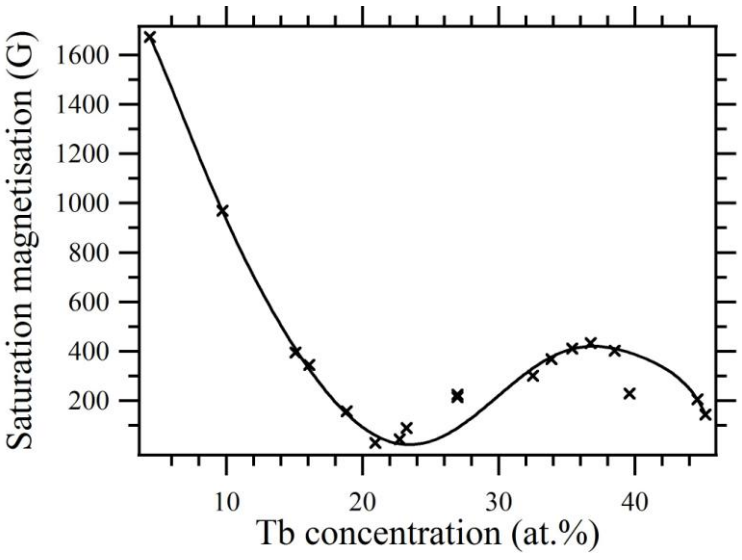

Fig. 1. The saturation magnetization as a function of the Tb concentration. The minimum of the function indicates the compensation composition.

1. Hans R. Kirchmayr, Carl A. Poldy, Handbook on the Physics and Chemistry of Rare Earths, 2, 56-320 (1979).
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